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Community perceptions towards nature conservation in the Eastern Cape Province, South Africa

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Abstract

Relationships between protected area managers and adjacent communities, as well as communities' attitudes, views and perceptions of these areas, are critical for the success of conservation efforts. It is important for protected area managers and administrators to understand how local communities view these areas and their management, so that they can build sustainable working rel ationships. This paper is based on a survey of 375 semi-structured questionnaires administered to household heads, living at distances ranging from the edge of the reserves to 50 km away from the reserve boundary across the Great Fish River, Mkambati, Hluleka, and Tsolwana nature reserves in the Eastern Cape Province, South Africa. The paper provides a longitudinal assessment of households' knowledge about the role of reserves and the reserves' impacts on livelihood assets. In addition to households' knowledge about the role of reserves, the paper also provides an assessment of people's attitudes towards their location and management, as well as views on the best way to manage the reserves. For 79% of community members, reserves were important as they were seen to conserve biodiversity and valuable ecological systems necessary for sustaining life. Most (75%) respondents indicated that closely located reserves gave them opportunities to learn about nature conservation and to subsidize their incomes through tourism ventures. However, 58% had a problem with reserves' staff, due to restrictions on resource use, which negatively impacted their livelihoods. Over half (51%) of the households argued that sustainable conservation can only be achieved through an integrated approach where conservation and local communities' needs are given equal weight. We concluded that reserve managers should look at communities as active partners in the management of protected areas if sustainable conservation objectives are to be realised.

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Keywords
Conservation knowledge, local communities, nature conservation, protected areas

Introduction

For decades protected areas have been seen as the cornerstone for conserving biological resources and systems (Mutanga et al. 2015). From 1872 through to the 1960s, nature was conserved as an unspoiled wilderness, where people were removed from areas designated for conservation, and economic development controlled to reduce conflict with natural systems (MacKenzie et al. 2017). Areas designated for establishment of protected areas are usually surrounded by large numbers of people, who depend on them for their livelihoods (Andrade and Rhodes 2012). Therefore, separating protected areas from their adjacent communities negatively affects these communities (Soliku and Schraml 2018).

The negative socio-economic impacts of protected areas on adjacent communities are well-documented. Wild animals that escape from the reserves attacked, injured and killed people as well as their livestock (Matema and Andersson 2015). In addition to injury and death of people and their livestock, wild animals also cause crop damage and increase labor costs of crop defence (Subakanya et al. 2018). When rangers find animals grazing inside protected areas 'illegally' they are impounded and their owners fined for breaking the regulations that govern protected areas management (Mackenzie 2012). Restrictions on the use of resources in protected areas force the community to resort to 'illegal' harvesting of these resources and, when found, they are arrested, harassed and heavily fined (Mackenzie 2012). Resource use restrictions lead to food and financial insecurity for communities residing around these areas, so exacerbating their poverty levels (Widianingisih et al. 2016). Food insecurity exacerbates hunger and malnutrition in communities around protected areas (Subakanya et al. 2018). Because of poor infrastructure around protected areas, these areas are devoid of services, hence people are forced to walk long distances to access these services as well as resources they need for their livelihoods (Bond and Mkutu 2018).

Tensions arise whenever local communities are negatively affected by protected areas as a result of restricted access to livelihood resources (Soliku and Schraml 2018). On the other hand, if local communities' needs and aspirations are considered and addressed, the relationship between local communities and protected areas management is likely to improve (Nguyen 2019). Mutually supportive relationships between local communities and protected areas are, therefore, critical to successful protected area management (Yatesa et al. 2019). Understanding and incorporating the views of local people in the process of decision-making and provision of alternative livelihood solutions are important steps towards successful conservation (Mir et al. 2015).

The Eastern Cape Province is the poorest province in South Africa (Statistics South Africa 2017). For this reason, natural resources, specifically non-timber forest prod-

ucts (NTFPs) play a crucial role in sustaining livelihoods (Shackleton and Shackleton 2004). If resources are not equitably shared between communities and reserve management, then poverty and the increased demand for NTFPs is likely to make nature reserves viable areas for exploitation by adjacent communities. The objective of this study was to provide a longitudinal assessment of households' views on the location and management of nature reserves as well as knowledge about the importance of reserves and how they are managed. The study therefore covered (1) knowledge on the role of reserves and how the reserves were managed, (2) attitudes towards the location and management of the reserves, and (3) views on the best way to manage the reserves.

Methods

Study area

The study was conducted in rural communities around four nature reserves located in the Eastern Cape Province of South Africa. These reserves were Hluleka Nature Reserve, Mkambati Nature Reserve, Tsolwana Nature Reserve and Great Fish River Nature Reserve (Fig. 1).

The study sites are located in a remote rural area. The residents around the sites are predominantly black and poor Statistics South Africa (2017). The report further stated that the majority of persons in the study area were without a formal education. Unemployment in the study area stood at 94% and the majority of those in work are employed in informal sectors (Statistics South Africa 2017). The report noted that

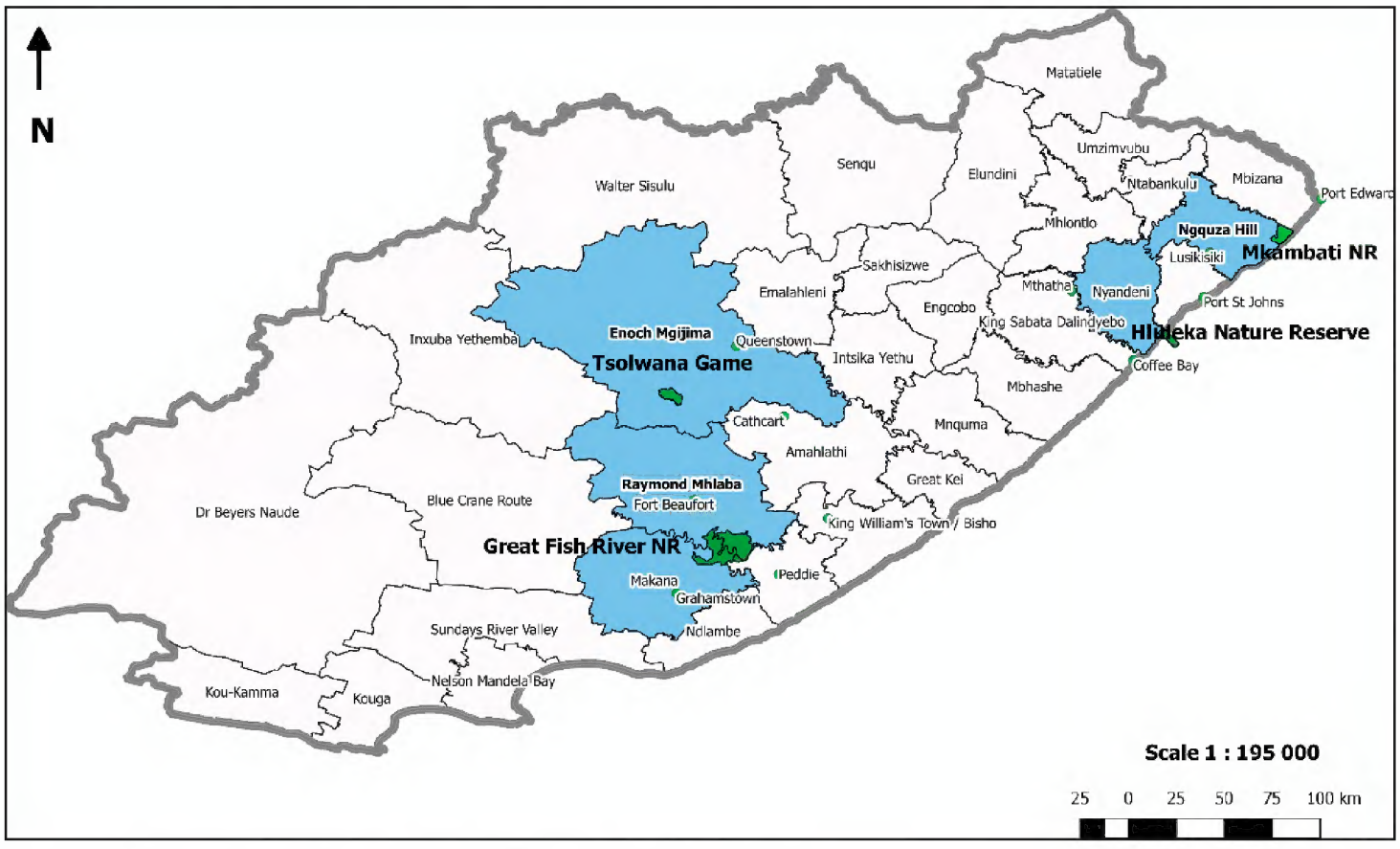

Figure 1. Location of the study sites in the Eastern Cape Province.

79% of people residing around the reserves lived in informal traditional dwellings. According to Statistics South Africa (2017), 42% of residents around the study area do not have toilets while 74% do not have access to clean water.

Data collection

The study sites were visited during 2015–2017 for the collection of data. Data on views and perceptions of communities on the role of reserves, how the reserves were managed, as well as perceptions on the location of the reserves, were collected. The investigation started with focus group discussions with communities adjacent to the reserves. For this purpose, eight focus groups were established, consisting of between four and eight household heads. Participants were selected by households on the basis that they were knowledgeable about the reserves and could represent the interests of the communities. Meetings were held at the homes of participants and facilitated in isiXhosa (by trained field assistants). Four focus group sessions were conducted per site – one for each distance category (0–10 km, 11–20 km, 21–30 km, and 31–50 km). The aim was to obtain a general picture of communities' knowledge on the roles of reserves and how the reserves were managed, attitudes towards the location and management of the reserves, as well as views on the best way to manage the reserves.

Focus group discussions were supplemented with 375 self-guided (where respondents filled the questionnaires by themselves) semi-structured questionnaires, administered to household heads adjacent to the four reserves. These household heads were selected via stratified random sampling (0–10 km (86 questionnaires), 11–20 km (81 questionnaires), 21–30 km (42 questionnaires) and 31 km and further to a maximum of 50 km (166 questionnaires)). The age of the informants ranged from 20 to 92 years. The questionnaire included questions across three broad categories: (1) knowledge about the role of reserves and how the reserves were managed, (2) attitudes towards the location and management of the reserves, and (3) views on the best way to manage the reserves.

Data on the specific distances were classified into suitable categories based on households' views and perceptions and summaries extracted. Descriptive statistics of communities' knowledge on the roles of reserves and how the reserves were managed, attitudes towards the location and management of the reserves, as well as views on the best way to manage the reserves, were computed. Cross-tabulation was performed to determine whether there were significant variations between distance and communities' knowledge about the roles of reserves, how they were managed, attitudes towards the location, management of the reserves, as well as views regarding the best way to manage them.

Ethical clearance

Ethical clearance was obtained from Rhodes University before fieldwork commenced. Before administering the questionnaires to the respondents, permission was sought from the chief and respective headmen in the study area. Respondents' consent was

also sought before the commencement of the survey. The purpose of the research was clearly explained to the respondents before the questions were administered to them. All respondents' concerns and fears about anonymity were attended to by maintaining confidentiality.

Results

Communities' knowledge of the role of the reserves and how they are managed

On average, 61% of the household heads knew the role of the reserves. The proportion of household heads who knew the role of reserves significantly decreased with distance from the reserves' boundaries ($P = 0.01$) (Table 1). Generally, 60% of the respondents knew how reserves were managed. The percentage of household heads' with this knowledge, significantly increased with distance from the reserves' boundaries ($P = 0.02$) (Table 1).

Communities' attitudes towards the location and management of the reserves

On average, 75% of the household heads were satisfied with the location of the reserves. The satisfaction significantly increased with distance from the reserves ($P = 0.001$). Those who were in favor of reserves stated that it gave them an opportunity to learn more about the fauna and flora, that they could subsidize their incomes through tourism ventures, and that they acquired employment directly or indirectly through opportunities created by reserves (Table 2).

Fifty-eight percent of household heads resented the way the reserves were managed. The percentage of household heads that resented the way the reserves were managed decreased with distance. There were statistically highly significant ($P = 0.001$) variations in terms of resentment at how the reserves were managed (Table 2). The most prominent reasons for respondents' dissatisfaction are that they incurred hardship due to restrictions on resource use and their movements (especially in Hluleka Nature Reserve).

Communities' views on the best way to manage the reserves

Eighteen percent of the household heads held the view that if the reserves could implement projects that created jobs for the local communities, and that if these jobs were shared equitably among the beneficiaries, then sustainable conservation could be achieved. Generally, the percentage of household heads holding the view that the reserves should provide jobs to them decreased with distance from the reserves' boundaries (Tables 3, 4).

Eighteen percent of the household heads said that involving communities in reserves' meetings and considering communities' views in all decision making will achieve sustainable conservation. Generally, the percentage of household heads who favored participating in the day-to-day management of the reserves, significantly increased

Table 1. Communities' knowledge (percentage) of the role of the reserves and their management.

Distance from reserve (km)	Knowledge on role of reserves	Knowledge on how reserves were managed
0–10	82	54
11–20	67	57
21–30	54	63
31–50	41	67

Table 2. Communities' attitudes towards the location and management of the reserves.

Distance from reserve	Percentage	
	Attitudes towards the location (satisfaction)	Attitudes towards the management approach (resentment)
0–10 km	43	96
11–20 km	76	74
21–30 km	84	49
31–50 km	93	12

Table 3. Communities' views (percentage*) on the best way to manage the reserves.

Ideas proposed for best management practices	Distance from reserve (km)			
	0–10	11–20	21–30	31–50
Implement projects that create jobs for local communities	23	14	16	17
Involving communities in reserves' meetings and considering communities' views in all decisions	16	11	25	19
Empowering local communities with knowledge on the importance of protected areas	6	2	10	4
Strengthening the security of wild animals	12	16	6	3
Aligning conservation with local communities' needs	18	13	6	0
Allowing communities uncontrolled access to natural resources in the reserves	5	5	0	1
Allowing communities controlled access to natural resources in the reserves	3	2	0	1
Strengthening law enforcement of trespassers	7	10	20	16
Willingness to participate in reserve activities	90	78	66	47

*Percentages do not add up to 100 due to the multiple choice options available to respondents.

Table 4. Variation of communities' knowledge, views and perceptions with changes in distance from the reserve boundaries.

Variable	Variation with distance	χ^2	P-Value
Knowledge about the role of reserves	Decreased	9.656	0.01
Knowledge about how the reserves are managed	Increased	3.343	0.02
Satisfaction of location of the reserves	Increased	54.98	0.00
Resentment of reserves' management styles	Decreased	42.068	0.00
Inclusion of local communities in reserves management	Increased	65.088	0.00
Uncontrolled access to natural resources in the reserves	Decreased	42.719	0.67
Reserves should provide jobs to the locals	Decreased	38.825	0.046
Strengthening law enforcement to keep off trespassers	Increased	120.749	0.84
Strengthening security to ensure safety of the locals and their livestock	Decreased	84.114	0.86
Empowering locals with conservation knowledge	Decreased	17.243	0.81
Meet communities' needs (roads, water and electricity)	Decreased	55.359	0.02
Controlled access to natural resources in the reserves	Decreased	40.98	0.00
Willingness to participate in reserves' activities	Decreased	44.576	0.00

with distance from the reserves' boundaries ($P = 0.001$) (Tables 3, 4). Household heads argued that involving locals in the day-to-day running of the reserves will inform them about the decisions managers make. Household heads also stated that reserve managers

should stop harassing community members and impounding their livestock, should they happen to accidentally enter the reserves.

Ten percent of household heads who held the opinion that empowering local communities with information on the importance of protected areas, will make them embrace the reserves, were located 21–30 km from reserves. Thereafter the percentage of household heads who agreed with this statement declined with distance from the reserves' boundaries (Tables 3, 4).

Nine percent of household heads stated that preventing wild animals from escaping and injuring or killing people and domestic animals will achieve sustainable conservation. Generally, the percentage of household heads who noted that enhancing security around the reserves would ensure the safety of locals and their livestock, decreased with distance from the reserves' boundaries (Tables 3, 4).

Nine percent of household heads indicated that aligning conservation with local communities' needs (improving physical infrastructure (roads, electricity and water) will achieve sustainable conservation. The percentage of household heads with this opinion decreased with distance from the reserves' boundaries (Tables 3, 4).

Three percent of household heads noted that allowing uncontrolled access to natural resources in the reserves was the only way to achieve sustainable conservation. Household heads who were in favour of uncontrolled access decreased with distance from the reserves' boundaries (Tables 3, 4).

A minority of household heads (3%) said that allowing controlled access to natural resources in the reserves will achieve sustainable conservation. The number of household heads holding this view decreased with distance from the reserves' boundaries (Tables 3, 4).

Thirteen percent of household heads favored strengthening law enforcement to ward off trespassers as a way of attaining sustainable conservation. Communities indicated that this will help curb unsustainable resource use by the locals, thereby sustaining them. Furthermore, 70% of household heads were willing to participate in reserve activities. The percentage of willingness to participate decreased with distance from the reserves (Tables 3, 4).

Discussion

Communities' knowledge of the role of the reserves and their management

Communities' knowledge about the role of the reserves significantly decreased with distance from the reserves' boundaries. Seventy-nine percent of household heads indicated that the reserves conserved biodiversity for future generations. They noted that when biodiversity is conserved, protected areas can supply essential goods and services important for sustaining both humans and ecosystem functioning. According to Gandiwa et al. (2014), because of the longstanding relationships between communities and protected areas, local communities have developed knowledge about the environments in which they live. Gandiwa et al. (2014) further noted that this knowledge and perspective are based on locally developed practices of resource use. It is therefore

not surprising that the knowledge about the role of reserves decreased with distance from the reserves' boundaries. Communities closer to the reserves have longstanding interactions with the reserves and, therefore, have more interactions with the reserves compared to those far from these areas.

Our study established that local communities knew and appreciated the importance of nature and natural resources. This is an indication that if local communities are given an opportunity to participate in the running of reserves, they are likely to be effective co-custodians. According to Soliku and Schraml (2018), social ecological systems are important for sustainable conservation. Gandiwa et al. (2014) assert that information about local people's knowledge and perceptions about conservation is important to the success of wildlife conservation because understanding and acknowledging residents' knowledge and perceptions about wildlife conservation can build constructive relationships between residents and protected area management. In our study, local communities knew and appreciated the importance of nature and natural resources. This is an indication that if local communities are given an opportunity to participate in the running of reserves, they are likely to be effective co-custodians. Seoraji-Pillai and Pillay (2017) found that communities and protected area managers had developed an understanding that led them to co-exist. Soliku and Schraml (2018) argue that locals have long been managing natural resources either consciously or unconsciously through local rules, taboos, and belief systems. For local communities to be effective custodians of natural resources, however, will require building trust between communities and reserve management. Mir et al. (2015) argued that putting humans at the centre of ecosystem management requires the building of ecological knowledge and relationships because ecosystems are complex adaptive systems characterized by historical dependency.

Knowledge about how the reserves are managed significantly increased with distance from the reserves' boundaries. This variation can be associated with the negative attitudes that locals had towards the way the reserves were managed, where communities closer to the reserves resented the way the reserves were managed. Bennett and Dearden (2014) noted that most people residing adjacent to protected areas resent these areas, ending up not interested in conservation efforts simply because they see no benefits flowing to them, resulting in a case of "us"- and -"them". Soliku and Schraml (2018) further noted that when local communities lack interest in the affairs of protected areas, they are likely not to know what is happening there. For effective conservation, therefore, it is important that conservationists find ways to entice local communities to be interested in the protected area management, and thus avoid making mistakes that can arise from central policies which ignore local realities (Pekor et al. 2019).

Local communities' attitudes towards the location and management of the reserves

Satisfaction with the location of reserves significantly increased with distance from the reserves' boundaries. Most people closer to the reserves were not satisfied with their

location because frequent disease outbreaks affected them and their livestock, as well as escaping wild animals that attacked and injured or killed them and their livestock. Most local communities also noted that restriction of access to natural resources negatively impacted on their livelihoods. Our findings differ from those of Mir et al. (2015) who found that despite 75% of surrounding communities suffering crop damage and 23% suffering livestock predation from wild animals, a majority (84%) of the respondents were still in favor of wildlife conservation. Our study is, however, in line with Soliku and Schraml (2018) who indicated that restricting access to natural resources which are crucial for people's livelihoods, results in negative attitudes toward protected areas. Therefore, protected areas and local communities can only co-exist if their needs and views of those living around them are incorporated in the decision-making process.

The number of people who resented the way the reserves were managed decreased with distance from the reserves' boundaries. According to Mutekwa and Gambiza (2017), when locals view protected areas as places and resources stolen from them, they are likely to resent them. People were restricted access to resources such as building materials, medicinal plants, mussels and fish that they needed for their livelihoods. They developed negative attitudes towards the reserves. Those far from the reserves depended less on the reserves' resources for their livelihoods, hence had no interest in how they were managed. Soliku and Schraml (2018) argued that restricting communities' access to natural resources that are crucial for their livelihoods can result in retaliation and hostile attitudes towards protected area objectives. This was the case in our study with communities perceiving the government as having 'stolen' their resources, leading to conflicts between reserve managers and local communities, especially in Mkambati and Hluleka.

Most local communities closer to the reserves disapproved of the managers that were in charge of the reserves. Most locals felt the managers were imposed on them from East London (the headquarters of Eastern Cape Parks and Tourism Authority). This created mistrust between local communities and reserve management. Soliku and Schraml (2018) noted that making decisions that affect people without consulting them can result in retaliation and hostile attitudes. This was the case in our study as people felt that they were not consulted or informed about the appointment of the managers. Local communities argued that reserve managers served the interests of the Eastern Cape Parks and Tourism Authority at the expense of their livelihoods.

Local communities' views on the best way to manage the reserves

The number of household heads who agreed with the statement that inclusion of local communities in day-to-day running to the reserves would enable sustainable conservation, decreased with distance from the reserves' boundaries. Those closer to the reserves felt that the reserves were too important to their livelihoods and that it was unethical to exclude them in decision making. Andrade and Rhodes (2012) stated that if communities do not benefit from protected areas, they do not have any interest in their management. Incorporating locals in conservation efforts can indeed promote effective

conservation. According to De Pourcq et al. (2017), understanding and incorporating the views of local people in decision-making and providing alternative livelihood solutions are important steps towards successful conservation. According to Mir et al. (2015), an inclusive approach to conservation improves trust and reduces transactions costs for managing protected areas. Stakeholder participation also reduces the likelihood that those in the periphery of the decision-making context are marginalized (Mutanga et al. 2017).

The percentage of household heads who indicated that law enforcement should be strengthened to keep trespassers away from the reserves increased with distance from the reserves' boundaries. This was expected because households closer to the reserves suffered hardships due to resource restrictions and constrained movement compared to those far from the reserves. Therefore, strict protection was inversely proportional to suffering and hardships among communities living around the reserves. According to Dewu and Roskat (2017), when communities living adjacent to protected areas see the benefits of protected areas, they are likely to support conservation efforts but where they face hardships and suffering they will not support any efforts that will bring more hardships and suffering to them. This was the case in this study.

The percentage of household heads who held the view that the reserves should provide jobs to them decreased with distance from the reserves' boundaries. This was expected because the unemployment rate decreased with distance from the reserves' boundaries. Galvin et al. (2018) found that when conservation projects in Zambia created jobs and enhanced household incomes of many local communities, their attitudes towards protected areas improved, reducing poaching, and ultimately enhanced conservation.

The percentage of household heads who indicated that empowering locals with conservation knowledge will help achieve sustainable conservation decreased with distance from the reserves' boundaries. According to Chevallier and Milburn (2015), when people have a clear understanding of environmental concerns, they will follow sustainable development practices. The higher percentage of people closer to the reserves who supported this view is associated with the interests they have, as well as their knowledge of the importance of protected areas to their livelihoods and ecosystem functioning.

Sustainable use of natural resources in protected areas can promote ecological integrity and at the same time improve the livelihoods of those living around protected areas. Access to resources is likely to be advocated by those who benefit more from them. It is, therefore, not surprising that the percentage of household heads supporting the view that controlled access will promote sustainable conservation decreased in line with distance from the reserves' boundaries. Soliku and Schraml (2018) attest that it is those who have more to gain from natural resources that will want access to them.

Since there were more people closer to the reserves who resented the way the reserves were managed than those farther afield, it is not surprising that the percentage of those who were willing to participate in reserve activities was higher closer to the reserves compared to far from them. The findings of our study therefore are in line with those of Amin et al. (2015) who argued that people residing adjacent to protected areas will participate in wildlife conservation activities when opportunities arise to try influ-

ence decisions. The findings of our study also concur with Dewu and Roskat (2017), who found that local communities are more likely to comply and to commit themselves to long-term conservation strategies when their knowledge and opinions are incorporated into protected area decision-making processes. The high number of people who were willing to participate in our study, can be attributed to the belief by locals that the reserves are important to their livelihoods and sustainable ecosystem functioning.

Conclusions

We found that communities around the reserves knew the importance of reserves and were willing to participate in any reserves' activities, if the opportunity is extended to them. On this basis, it can safely be said that if communities around the reserves are involved in the activities of the reserves, and their views incorporated in decision making, sustainable conservation can be achieved in the province.

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